



PATENT APPLICATION

PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

Takaomi TOIHARA

On Appeal from Group: 1775

Application No.: 10/091,537

Examiner: A. Turner

Filed: March 7, 2002

Docket No.: 112172

For: **HARD MULTILAYER COATING, HARD MULTILAYER COATED TOOL INCLUDING THE HARD MULTILAYER COATING, AND METHOD OF FORMING THE HARD MULTILAYER COATING**

APPEAL BRIEF TRANSMITTAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached hereto are three (3) copies of our Brief on Appeal in the above-identified application.

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For the convenience of the Finance Division, two additional copies of this transmittal letter are attached.

Respectfully submitted,

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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FORMING THE HARD MULTILAYER COATING

BRIEF ON APPEAL

Appeal from Group 1700

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TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	1
A. Real Party in Interest.....	1
B. Statement of Related Appeals and Interferences	1
C. Status of Claims	1
D. Status of Amendments	1
II. SUMMARY OF THE INVENTION	2
III. THE APPLIED REFERENCES	3
IV. ISSUES	3
V. GROUPING OF CLAIMS	4
VI. ARGUMENT	4
A. Anticipation	4
1. Factual Inquiries to Determine Anticipation	4
2. Examiner's Statement of the Rejection.....	4
3. Brandle Does Not Anticipate the Claimed Invention.	5
B. Obviousness	7
1. Factual Inquiries to Determine Obviousness/Nonobviousness	7
2. The Examiner's Statement of the Rejection.....	7
3. The References Would Not Have Rendered Obvious the Claimed Invention.....	8
VII. CONCLUSION.....	13

I. INTRODUCTION

This is an appeal from an Office Action mailed December 1, 2003, finally rejecting claims 3, 4, 9, and 11 of the above-identified patent application. No claims are allowed.

A. Real Party in Interest

The real party in interest for this appeal and the present application is OSG Corporation, by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 013366, Frame 0526.

B. Statement of Related Appeals and Interferences

There are presently no appeals or interferences, known to Appellant, Appellant's representative, or the Assignee, which will directly affect or be directly affected by or have a bearing upon the Board's decision in the pending appeal.

C. Status of Claims

Claims 3, 4, 9, and 11 are pending. Claims 3, 4, and 9 are rejected under 35 U.S.C. §102(e). Claim 11 is rejected under 35 U.S.C. §103(a). Claims 1, 2, 5-8, and 10 have been canceled. Claims 9 and 11 are independent. Claims 3 and 4 directly depend from claim 9. Claims 3, 4, 9, and 11 are set forth in the attached Appendix.

D. Status of Amendments

An Amendment after the first Office Action on the merits was filed September 16, 2003, wherein claims 1, 2, and 5-8 were canceled, claims 3 and 4 were amended, and claims 9-11 were added. In a final Office Action, dated December 1, 2003, the Examiner withdrew claim 10 from consideration, rejected claims 3, 4, and 9 under 35 U.S.C. §112, second paragraph, and under 35 U.S.C. §103(a), and rejected claim 11 under 35 U.S.C. §102(e). Applicant requested reconsideration in an After-Final Amendment filed March 1, 2004, wherein claim 10 was canceled and claims 3, 4, 9, and 11 were amended. By an Advisory Action dated March 31, 2004, it was indicated that the After-Final Amendment would be

entered, and upon entry, the rejection under 35 U.S.C. §102(e) would be maintained, the rejection under 35 U.S.C. §103(a) would be maintained, and the rejection under 35 U.S.C. §112, second paragraph, would be withdrawn. Thus, all requested claim amendments have been entered.

II. SUMMARY OF THE INVENTION

The invention is directed to hard multilayer coatings to cover base materials. In one embodiment, the coating comprises a plurality of first coating layers consisting of $(\text{Ti}_x\text{Al}_{1-x})(\text{C}_y\text{N}_{1-y})$, wherein $0.20 \leq x \leq 0.60$ and $0 \leq y \leq 0.5$, and at least one second coating layer including or consisting of CrN (page 3, paragraph [0007]; page 9, paragraph [0025]; original claim 1). The first and second coating layers are alternately superposed on each other (page 3, paragraph [0007]). Regarding the first coating layers, one of the layers constitutes an outermost layer of the multilayer coating, while another of the first coating layers constitutes an innermost layer of the multilayer coating (page 3, paragraphs [0007] and [0008]). In other words, one of the first coating layers is held in contact with the base material (Figure 1B, wherein "12" is the base material, "22" is the first coating layer, and "24" is the second coating layer).

In another embodiment, the hard multilayer coating comprises at least one first coating layer and at least one second coating layer, wherein each second coating layer includes CrN and $(\text{Ti}_x\text{Al}_{1-x})(\text{C}_y\text{N}_{1-y})$, wherein $0.20 \leq x \leq 0.60$ and $0 \leq y \leq 0.5$ (page 7, paragraph [0018]; original claim 4).

In particular, in one embodiment, the claimed invention is directed to a hard multilayer coating comprising at least one first coating layer and at least one second coating layer alternately superposed on each other, wherein each first coating layer consists of $(\text{Ti}_x\text{Al}_{1-x})(\text{C}_y\text{N}_{1-y})$, wherein $0.20 \leq x \leq 0.60$ and $0 \leq y \leq 0.5$, and each second coating layer includes CrN and $(\text{Ti}_x\text{Al}_{1-x})(\text{C}_y\text{N}_{1-y})$, wherein $0.20 \leq x \leq 0.60$ and $0 \leq y \leq 0.5$, and wherein

one first coating layer constitutes an outermost layer of the hard multilayer coating (independent claim 11).

In another embodiment, the claimed invention is directed to a hard multilayer coating comprising first and second coating layers alternately superposed on each other, and a base material covered by the first and second coating layers, wherein the first coating layer consists of a plurality of first coating layers and the second coating layer consists of at least one second coating layer, wherein each first coating layer consists of $(\text{Ti}_x\text{Al}_{1-x})(\text{C}_y\text{N}_{1-y})$, wherein $0.20 \leq x \leq 0.60$ and $0 \leq y \leq 0.5$, and each second coating layer includes or consists of CrN, and wherein one first coating layer constitutes an outermost layer of the first and second coating layers, while another first coating layer constitutes an innermost layer of the first and second coating layers, and is held in contact with the base material (independent claim 9).

III. THE APPLIED REFERENCES

The applied references are:

U.S. Patent No. 6,492,011 to Brändle et al. ("Brandle");

U.S. Patent No. 5,503,912 to Setoyama et al. ("Setoyama"); and

U.S. Patent No. 5,882,777 to Kukino et al. ("Kukino").

IV. ISSUES

The issues on appeal are:

1) whether claim 11 is anticipated under 35 U.S.C. §102(e) by Brandle; and

2) whether claims 3, 4, and 9 would have been obvious under 35 U.S.C. §103(a) over

Setoyama in view of Brandle or Kukino in view of Brandle.

V. GROUPING OF CLAIMS

Each claim of this patent application is separately patentable and upon issuance of a patent is entitled to a separate presumption of validity under 35 U.S.C. §282. For convenience in handling this appeal, the rejected claims are grouped and argued as follows:

Group I - claim 11; and

Group II - claims 3, 4, and 9.

Thus, pursuant to 37 C.F.R. §1.192(c)(7), in this appeal, the rejected claims within each group stand or fall together.

VI. ARGUMENT

A. Anticipation

1. Factual Inquiries to Determine Anticipation

A claim defining an invention that is not new is considered to be anticipated by a prior art reference, provided that the reference alone teaches "each and every element as set forth in the claim . . . either expressly or inherently." *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987). *See also Titanium Metals Corp. v. Banner*, 778 F.2d 775, 780 (Fed. Cir. 1985); *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349 (Fed. Cir. 2002). Under 35 U.S.C. §102(e), the prior art reference must have an earlier effective U.S. filing date to be relied upon to reject the claims. *Sun Studs, Inc. v. ATA Equip. Leasing, Inc.*, 872 F.2d 978, 983 (Fed. Cir. 1989).

2. Examiner's Statement of the Rejection

Claim 11 is rejected under 35 U.S.C. §102(e) as being anticipated by Brandle. It is the Examiner's position that Brandle discloses "the claimed alternating coating with the claimed components and thickness" (Dec. 1, 2003, Office Action, page 3). According to the Examiner, Brandle discloses "an overlap in the claimed materials and thus includes the claimed components" for the second coating. *Id.*

3. **Brandle Does Not Anticipate the Claimed Invention.**

a. **Brandle does not disclose layers composed of (1) TiAlCN or TiAlN and (2) CrN-TiAlCN or CrN-TiAlN.**

Brandle describes a multilayer coating on a workpiece body containing a hard material layer (element 5),¹ a soft intermediate layer (element 3), and an optional soft metal layer (element 7) (col. 2, lines 9-13; col. 2, lines 34-41; col. 3, lines 60-63, Figs. 1-2).

The hard material layer (element 5) constitutes an outermost layer of the coating (Brandle claim 1). The hard material layer has a relatively high degree of hardness and contains at least one of the following materials: (1) nitride of titanium and aluminum (TiAlN), (2) carbonitride of titanium and aluminum (TiAlCN), (3) carbonitrooxide of titanium and aluminum (TiAlCNO), (4) nitroboride of titanium and aluminum (TiAlNB), or (5) carbonitroboride of titanium and aluminum (TiAlCNB) (col. 4, lines 35-49).

The intermediate layer (element 3) has a relatively low degree of hardness and predominately contains at least one of the following materials: (1) nitroboride of chromium, tantalum, zirconium, or titanium (Cr, Ta, Zr, or Ti)(NB), (2) carbonitroboride of chromium, tantalum, zirconium, or titanium (Cr, Ta, Zr, or Ti)(CNB), (3) carbonitrooxide of chromium, tantalum, zirconium, or titanium (Cr, Ta, Zr, or Ti)(CNO), (4) nitride of chromium, tantalum, or zirconium (Cr, Ta, or Zr)(N), or (5) carbonitride of chromium, tantalum, or zirconium (Cr, Ta, or Zr)(CN) (col. 4, lines 35-49).

The optional soft metal layer (element 7) contains chromium, tantalum, titanium, or zirconium, depending on the metal in the softer intermediate layer (col. 5, line 42, to col. 6, line 6).

¹ All element references are from Figures 1 and 2 of Brandle.

b. Brandle fails to teach the elements of both coating layers of claim 11, and thus Brandle cannot anticipate claim 11.

As noted above, in order for a reference to anticipate a claim, the reference must teach every element in the claim. The multilayer coating of claim 11 comprises first and second coating layers, wherein each first coating layer consists of $(\text{Ti}_x\text{Al}_{1-x})(\text{C}_y\text{N}_{1-y})$, wherein $0.20 \leq x \leq 0.60$ and $0 \leq y \leq 0.5$, and each second coating layer includes CrN and $(\text{Ti}_x\text{Al}_{1-x})(\text{C}_y\text{N}_{1-y})$, wherein $0.20 \leq x \leq 0.60$ and $0 \leq y \leq 0.5$. Thus, the layers, in the minimum combination, comprise (1) TiAlCN or TiAlN in an outermost layer above (2) CrN-TiAlCN or CrN-TiAlN.

Brandle's layers, alone or in combination, do not include the components of the first and second coating layers in claim 11 as illustrated in the table below. There is no "overlap" in layer components as asserted by the Examiner since not one single combination of layer components in Brandle provides the requisite combination of first and second coating layer components in claim 11.

Claim 11 Outermost Layer Components	Brandle Outermost Layer Components	Claim 11 Components of Second Layer	Brandle Components of Intermediate Layer*
TiAlN	TiAlN	CrN-TiAlCN	CrNB, TaNB, ZrNB, or TiNB
TiAlCN	TiAlCN	CrN-TiAlN	CrCNB, TaCNB, ZrCNB, or TiCNB
	TiAlCNO		CrCNO, TaCNO, ZrCNO, or TiCNO
	TiAlNB		CrN, TaN, or ZrN
	TiAlCNB		CrCN, TaCN, or ZrCN

*Optional soft metal layer components are Cr, Ta, Zr, and Ti, depending on the metal selected as the softer intermediate layer metal (col. 5, line 43, to col. 6, line 6).

Since Brandle does not teach a hard multilayer coating comprising each and every component of the coating in claim 11, Brandle cannot anticipate claim 11.

c. Conclusion

Claim 11 requires a first coating layer consisting of specific components and a second coating layer including specific components. Brandle teaches multilayer coatings, but they do

not consist of or even comprise the components set forth in claim 11. Therefore, Brandle does not anticipate claim 11. The rejection should thus be reversed and withdrawn.

B. Obviousness

1. Factual Inquiries to Determine Obviousness/Nonobviousness

An obviousness analysis requires an assessment of: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness, if any. *Graham v. John Deere Co.*, 383 U.S. 1, 17-19 (1966). After assessing these four factors, it must be determined whether the prior art as a whole would have suggested the claimed invention to one of ordinary skill in the art. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

Generally, at least two references are combined to establish obviousness. When references are used in combination, there must be some teaching or suggestion to support the combination. *WMS Gaming Inc. v. Int'l Game Tech.*, 184 F.3d 1339 (Fed. Cir. 1999); *In re Oetiker*, 977 F.2d 1443 (Fed. Cir. 1992). The suggestion to combine references may be found in explicit or implicit teachings within the references, from the knowledge of those of ordinary skill in the art, or from the nature of the problem to be solved. *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998). In addition, it must be determined whether the ordinarily skilled artisan would have had a *reasonable* expectation of success in practicing the claimed invention. *In re O'Farrell*, 853 F.2d 894, 904 (Fed. Cir. 1988).

2. The Examiner's Statement of the Rejection

Claims 3, 4, and 9 are rejected under 35 U.S.C. §103(a) as being unpatentable over Setoyama in view of Brandle or Kukino in view of Brandle.

The Examiner characterized Setoyama and Kukino as disclosing alternating coatings for substrates, wherein the coatings may include CrN and TiAlN (Dec. 1, 2003, Office

Action, page 3). The Examiner concluded that it would have been obvious to one of ordinary skill in the art at the time of the invention to alternate between layers of CrN and TiAlN in view of Brandle, which discloses that when CrN and TiAlN are present, "they may be overlapped to improve adherence." *Id.*

3. The References Would Not Have Rendered Obvious the Claimed Invention

As noted above, in order to render the claims *prima facie* obvious, there must be an incentive, suggestion, or motivation in the art to make the recited combination of references, and there must be a reasonable expectation of success in obtaining the claimed invention based on the recited combination of references. Neither Setoyama nor Kukino discloses the components of claims 3, 4, and 9, and Brandle fails to remedy the defects of Setoyama or Kukino.

a. Setoyama does not disclose layers composed of (1) TiAlCN or TiAlN and (2) CrN.

Setoyama teaches forming a laminate (element 1) on a substrate (element 2) by alternating layers to form a cubic, crystal structure (Figures 1A, 1B, and 2). The first layer is composed of a nitride or carbonitride of at least one element from Group IVa,² Group Va,³ or Group VIa,⁴ of the periodic table, or aluminum or boron, wherein the nitride or carbonitride compound has a cubic, crystal structure and metallic bonding properties (claim 1).

The second layer is composed of a covalent compound, preferably aluminum or boron, and has a crystal structure other than cubic at normal temperature and normal pressure under an equilibrium state (claims 1 and 2). The alternating layers form a laminate having an overall cubic, crystal structure (col. 2, lines 40-47).

² Group IVa elements = Ti, Zr, Hf, Rf

³ Group Va elements = V, Nb, Ta, Db

An intermediate layer (element 4) may be added to the substrate underneath the laminate (Figure 2; col. 5, lines 47-62). The intermediate layer comprises at least one element from Group IVa, Group Va, or Group VIa of the periodic table or at least one compound selected from the group consisting of carbon, nitrogen, and oxides of an element in Group IVa of the periodic table (col. 3, lines 17-27).⁵

b. Kukino does not disclose layers composed of (1) TiAlCN or TiAlN and (2) CrN.

Kukino teaches forming a "[s]uper hard composite material" comprising a film (element 1) consisting of "super thin films (a) and (b) each deposited alternatively on" a substrate (element 2) (Figure 1; abstract). The first layer (a) is composed of a nitride or carbonitride of at least one element from Group IVa, Group Va, or Group VIa of the periodic table, or aluminum or boron, wherein the nitride or carbonitride compound has a cubic, crystal structure and metallic bonding properties (abstract; examples).⁶

The second layer (b) is composed of a covalent compound, preferably aluminum or boron, and has a crystal structure other than cubic at ambient temperature and pressure under an equilibrium state (col. 3, lines 18-20; claim 1). The alternating layers form a laminate having an overall cubic, crystal structure (claim 1).

⁴ Group VIa elements = Cr, Mo, W, Sg

⁵ Setoyama refers to elements from Groups IVa, Va, and VIa as indicated. Based on the description of the Setoyama laminate in the specification and on the elements provided in the Setoyama examples, it is clear that elements Ti, Zr, Hf, Rf, V, Nb, Ta, Db, Cr, Mo, W, and Sg are intended, which under former European IUPAC convention terminology are elements of Groups IVa, Va, and VIa.

⁶ Kukino refers to elements from Groups IVa, Va, and VIa (abstract) as well as Groups IVb, Vb, and VIb (claim 1). Based on the description of the Kukino laminate in the specification and on the elements provided in the Kukino examples, it is clear that elements Ti, Zr, Hf, Rf, V, Nb, Ta, Db, Cr, Mo, W, and Sg are intended, which under former European IUPAC convention terminology are elements of Groups IVa, Va, and VIa and under former United States IUPAC convention terminology are elements of Groups IVb, Vb, and VIb.

An intermediate layer (element 3) may be added to the substrate underneath the laminate (Figure 1). The intermediate layer comprises a boride, nitride, carbide, or oxide compound of an element from Group IVa, Group Va, or Group VIa of the periodic table (col. 4, lines 21-31).

c. **There is no incentive, suggestion, or motivation to combine Setoyama and Brandle or Kukino and Brandle.**

The Examiner's position appears to be that neither Setoyama nor Kukino teaches *alternating* layers of CrN and TiAlN. To remedy the defects of the primary references, the Examiner cited Brandle as teaching that one of ordinary skill in the art would have known to alternate layers of CrN and TiAlN to improve adhesion of the coating to the substrate. However, first, neither Setoyama nor Kukino teach even single layers of CrN and TiAlN, and second, Brandle does not teach that one should specifically alternate CrN- and TiAlN-containing layers to improve adhesion. Moreover, claims 3, 4, and 9 are not limited to alternating layers of CrN and TiAlN.

Regarding the first point, the alternating layers of Setoyama and Kukino are: (1) ((Ti, Zr, Hf, Rf, V, Nb, Ta, Db, Cr, Mo, W, or Sg)(CN or N)), Al, or B; and (2) Al or B. Thus, there is no disclosure of layers of CrN *and* TiAlN. Since layers of CrN and TiAlN are not disclosed in either Setoyama or Kukino, such layers cannot be alternated as allegedly suggested by Brandle.

Regarding the second point, Brandle does not disclose improving adherence by alternating layers of CrN and TiAlN. Instead, Brandle discloses improving adherence of a hard aluminum-containing layer to a substrate by inserting a softer intermediate layer between the hard aluminum-containing layer and the substrate. One of ordinary skill in the art reviewing Setoyama or Kukino would not consult Brandle to improve adherence since both Setoyama and Kukino already teach the concept of using a softer intermediate layer between

the substrate and laminate to improve adherence. Thus, there is no motivation, incentive, or suggestion to combine Setoyama and Brandle or Kukino and Brandle.

The Setoyama and Kukino cubic crystal structure laminates are formed on substrates that are optionally coated with an intermediate layer. There is no indication in Setoyama or Kukino that one of ordinary skill in the art could or should create a multilayer coating using the components recited in Appellant's claims 3, 4, and 9, especially in view of the presence of chromium in the second coating layer of the claimed multilayer coating since chromium has a *cubic* structure, and thus possesses a property specifically excluded from layer (b) in Setoyama and Kukino.

Due to the absence of an incentive, motivation, or suggestion to combine the references, the Examiner has not established a *prima facie* basis for rejection under 35 U.S.C. §103.

d. **There is no expectation of success in obtaining the claimed invention.**

In the claimed hard multilayer coating, the arrangement of layers requires that the innermost *and* outermost layers are first coating layers, which are harder than the second coating layer(s). The improved adhesion allegedly disclosed by Brandle requires that the innermost layer is the softer intermediate layer (or optional soft metal layer). Thus, if one of ordinary skill in the art reviewing Setoyama or Kukino would have been motivated by Brandle to insert a soft layer, which is not Appellant's position, then the coating would have a soft layer next to the substrate. This is *not* the claimed invention.

Due to the absence of a likelihood of success in obtaining the claimed invention, the Examiner has not established a *prima facie* basis for rejection under 35 U.S.C. §103.

e. **The combination of Setoyama and Brandle or Kukino and Brandle impermissibly modifies Setoyama or Kukino.**

Setoyama and Kukino focus on the formation of crystal structure laminates. The layers (a) and (b) have specific crystalline structure requirements, and thus cannot be substituted with the Brandle coating layers. For example, Brandle discloses the incorporation of nitride or carbonitride of chromium, tantalum, or zirconium in the softer, intermediate layer. At 25°C, i.e., ambient (or ordinary) temperature, and 1 atm, i.e., normal (or ordinary) pressure, at least chromium and tantalum have a cubic crystal structure. However, the Setoyama corresponding layer, layer (b), has a crystal structure *other than cubic* at normal temperature and pressure (Setoyama claim 1), and the Kukino corresponding layer, layer (b), has a crystal structure *other than cubic* at ambient temperature and pressure (Kukino claim 1). Thus, the Setoyama and Kukino layer (b) components cannot be substituted with the corresponding softer intermediate layer of Brandle without impermissibly modifying the Setoyama and Kukino laminated coatings. *In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984); *In re Ratti*, 270 F.2d 810 (CCPA 1959).

f. **Conclusion**

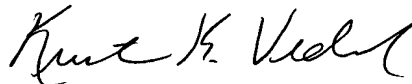
The Examiner relied on the presence of individual elements of the claimed coating in the cited references. However, as exemplified above, the mere recitation of individual pieces of the claimed coating in separate references does not teach or suggest the selective combination of these pieces plus the addition of undisclosed pieces to achieve the claimed invention. In addition, merely picking individual teachings from references and forcing their combination without any incentive, motivation, or suggestion to do so is an improper approach to an obviousness analysis and, in this case, produces a coating other than claimed and impermissibly modifies the primary references.

The cited references do not teach or suggest the claimed multilayer coatings, alone or in any combination. Appellants respectfully assert that since no motivation exists for combining the cited references and since there is no likelihood of success in obtaining the claimed invention even if the references are combined, no *prima facie* case of obviousness has been established. The rejections should thus be reversed and withdrawn.

VII. CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that claims 3, 4, 9, and 11 define patentable subject matter under 35 U.S.C. §§102(e) and 103(a) over the cited references, and thus are in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the rejections of claims 3, 4, 9, and 11.

Respectfully submitted,



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Enclosure:
Appendix

APPENDIX

Claims

1.-2. (Canceled)

3. (Previously Presented) A hard multilayer coating according to claim 9, wherein each first coating layer has an average thickness of 10-2000nm while each second coating layer has an average thickness of 10-1000nm, and wherein said hard multilayer coating has a total thickness of 0.5-20 μ m.

4. (Previously Presented) A hard multilayer coating according to claim 9, wherein each second coating layer further includes $(\text{Ti}_x \text{Al}_{1-x}) (\text{C}_y \text{N}_{1-y})$ wherein $0.20 \leq x \leq 0.60$, $0 \leq y \leq 0.5$.

5.-8. (Canceled)

9. (Previously Presented) A hard multilayer coating comprising first and second coating layers which are alternately superposed on each other, and a base material which is covered by said first and second coating layers,

wherein said first coating layer consists of a plurality of first coating layers and said second coating layer consists of at least one second coating layer,

wherein each first coating layer consists of $(\text{Ti}_x \text{Al}_{1-x}) (\text{C}_y \text{N}_{1-y})$ wherein $0.20 \leq x \leq 0.60$, $0 \leq y \leq 0.5$, while each second coating layer includes or consists of CrN,

and wherein one first coating layer constitutes an outermost layer of said first and second coating layers, while another first coating layer constitutes an innermost layer of said first and second coating layers, and is held in contact with said base material.

10. (Canceled)

11. (Previously Presented) A hard multilayer coating comprising at least one first coating layer and at least one second coating layer which are alternately superposed on each other,

wherein each first coating layer consists of $(\text{Ti}_x \text{Al}_{1-x}) (\text{C}_y \text{N}_{1-y})$ wherein $0.20 \leq x \leq 0.60$, $0 \leq y \leq 0.5$, while each second coating layer includes CrN and $(\text{Ti}_x \text{Al}_{1-x}) (\text{C}_y \text{N}_{1-y})$ wherein $0.20 \leq x \leq 0.60$, $0 \leq y \leq 0.5$,

and wherein one first coating layer constitutes an outermost layer of said hard multilayer coating.